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**Cardiac repair and restoration using human embryonic stem cells.**

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**Public Summary:**

Advances in directed differentiation of human embryonic stem cells (hESCs) toward cardiac lineages have generated much interest within the myocardial therapy field. Beyond the promise that hESCs would provide a supply of new cardiomyocytes to the damaged heart, recent studies have also shown that paracrine effects of stem cell therapy may facilitate myocardial healing. This review describes the advantages of hESCs for these purposes, current methods for directing differentiation of hESCs toward cardiac fates, approaches to purification and engineered selection of hESC-derived cardiomyocytes and cardiac precursors, as well as animal studies that have shed light on the therapeutic uses of hESCs in cardiac regenerative medicine.

**Scientific Abstract:**

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